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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Schneegans, *et al.* Docket No.: 2001 P 17353 US
Serial No.: 10/826,954 Art Unit: 2829
Filed: April 15, 2004 Examiner: Jimmy Nguyen
For: Probe Needle for Testing Semiconductor Chips and Method for Producing
Said Probe Needle

Mail Stop: After Final
Commissioner for Patents
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Dear Sir:

All claims have been finally rejected as being unpatentable over Smith (U.S. Patent No. 5,944,537, hereinafter "Smith"). Applicants respectfully submit that Smith does not teach or suggest the elements of the claimed invention and, therefore, cannot anticipate or make obvious the claims. Each of the independent claims 6, 11 and 18 will be discussed here.

For the purpose of this filing, Applicants have limited the number of issues being raised. That being said, Applicants reserve the right to raise other issues at a later date.

1. Claims 6 and 18 require "a substantially linear elongated member"

Claims 6 and 18 were both rejected as being anticipated by Smith. Both claims 6 and 18 recite a probe needle that includes "a substantially linear elongated member." Smith simply does not teach or suggest a substantially linear member. Contrary to the assertions of the Final Rejection, Smith teaches and suggests a contact member that is always curved; the contact member in Smith is never substantially linear.

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The Final Rejection states that "under the normal condition which is not contact with the device (101), the elongate member (15) is linear elongated member with the fixed end (anchor portion 12) fasten to the substrate (14)." Final Rejection, page 2. This statement, however, is in direct contradiction of the very explicit teachings of the Smith reference. In particular, Smith states:

Each spring contact 15 is formed such that a stress gradient $\Delta\sigma/h$ is introduced into the spring contact 15. When the spring contact 15 is formed, the metal layer comprising the spring contact 15 is deposited such that compressive stress is present in lower portions of the metal layer and tensile stress is present in upper portions of the metal layer. ... *The stress gradient $\Delta\sigma/h$ causes the spring contact 15 to bend into the shape of an arc having a radius r .*

Smith, col. 5, lines 46-57 (emphasis added).

These statements *cannot* be read to imply that the free portion of the metal strip is substantially linear before contact and bends only after contact, as stated in the Final Rejection. As is clear from the equation presented in column 5 of Smith, the member is substantially linear (i.e., radius $r = \infty$) *only* when the inherent stress gradient $\Delta\sigma$ is zero. Smith, col. 5, eq. (1). However, the whole point of the invention in Smith is to create a contact member by inherent stress gradient, which is *not* zero. Smith, Abstract ("an inherent stress gradient in the spring contact causes a free portion of the spring contact to bend up and away from the substrate.") Therefore, a substantially linear member as disclosed in the present application, with radius $r = \infty$, is not taught, suggested, or remotely disclosed by Smith.

Further, the invention in Smith "also provides an elastic spring contact having an *inherent stress gradient* that causes the free portion of the spring contact to *bend away from a substrate* to form a "shepherd's hook" shape." Smith, col. 3, lines 51-54 (emphasis added). If a member has an inherent stress gradient then it *cannot* remain substantially linear in the absence of external forces. See Smith, col. 5, lines 40-45 ("a strip of metal having no inherent stress gradient inherent in the

metal will lie flat... Likewise if a uniform stress gradient ... is introduced into the flat metal strip, the metal strip will bend into an arc shape.")

Smith further points out that the free portion remains *curved up* even after annealing the spring contact. Smith, col. 8, lines 25-26. Thus, the Final Rejection is incorrect when it states that the elongated member is linear when it is not in contact with the device. Smith makes it clear that the elongated member is curved before contact with any device. Smith, Figs. 6, 11, 12, 23, 28.

These points were raised in a Response Under 37 C.F.R. § 1.116. In response, the Advisory Action states the "spring contact 15 is bend into the shape of an arc having a radius r , it means that before it bends to the shape of arc, the spring contact 15 has structure as elongated member." The Advisory Action concludes that "a structure that illustrated as elongated member will read on the claims structure eventhought it will re-shaped later."

The Examiner appears to be stating that during the manufacturing process, the spring contact 15 was once linear. (See *e.g.*, Figures 7 and 8). Even assuming for the sake of argument that this statement is true, the claims are still patentable.

Claim 6 specifically recites a probe needle with "a substantially linear elongated member including a fixed end that is fastened in a holding element." The probe needle further includes "a contact tip attached at a free end of the substantially linear elongated member." The reference provides no teaching that the unmanufactured spring contact has either a fixed end fastened in a holding element or a contact tip attached to a free end.

Claim 18 recites a method that includes contacting a test probe to at least one of the pads of a semiconductor wafer, the test probe being attached to a probe card and including a substantially linear elongated member with a contact tip. An electrical test is performed by applying a test signal to the semiconductor wafer through the test probe. Applicants respectfully submit that any alleged

shape of a test probe during its manufacture is not remotely relevant to its very explicitly claimed shape during use. A rejection cannot be made without considering the explicit language of the claim.

Finally, the Advisory Action states that the term "substantiall linear elongated member" means that "the contact member is not absolutely is an elongated member but its structure is almost as elongated member." Applicants agree that an elongated member that is substantially linear does not need to be absolutely perfectly linear. Applicants strongly assert, however, that substantially linear elongated members cannot include any elongated members that are not even remotely linear. Use of the term "substantially" does not mean the word that is being described can be completely ignored.

2. Claim 11 requires that "the coating with titanium and titanium nitride takes place in situ"

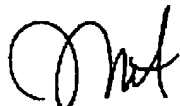
Claims 11-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Smith. Claim 11 explicitly recites that "the coating with titanium and titanium nitride takes place in situ." The Final Rejection apparently ignores this limitation in its rejection of claim 11. Further, this point was raised in the after-final response and the Advisory Action still ignores this limitation. Applicants respectfully submit that all limitations must be considered when rejecting the claims.

Unlike in the present application, deposition of an adhesive layer and a hard coating layer over the contact tip of the probe needle in Smith is not *in situ*. Nowhere in Smith is there any suggestion that the adhesive layer and coating layer can be deposited in situ. In fact, these processes must be consecutive processes in Smith because the adhesive layer is titanium, while the coating layer is gold. *See* Smith, col. 10, lines 16-26. Simply stated, the Final Rejection fails to make even a *prima facie* case of unpatentability.

In view of the above, Applicants respectfully request allowance of the present invention. The final rejection of claims 1 and 18 is in direct contradiction with the explicit teachings of the relied upon reference. The new position taken in the Advisory Action also does not provide any teaching or suggestion of the claimed invention. As for claim 11, explicit limitations, which are neither taught by nor obvious in view of the relied upon reference, have been ignored during examination.

Respectfully submitted,

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Date



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